

Antepartum surveillance (Assessment / Monitoring)

Fetal Oxygenation:

- Blood is formed mainly by Hb F (70%) at term
- Hb F has high affinity to O₂ → Shift to the Left of the oxygen dissociation curve
- Baby needs about 8 ml oxygen /Kg/min while adult need only 3 ml/kg/min
- Oxygen is needed for the development of all organs esp. CNS
- Different functions of the fetus depend on brain centers development that appear and function at different fetal ages. For example: Center of Fetal Tone (control movements) begins to function 7-9 w *1st Center to Develop & Last to be damaged by hypoxia

Parameters of Assessment:

1- Gestational Age 2- Fetal Hypoxia 3- Fetal Growth 4- Fetal Anomalies

1- Gestational Age:

Types of Dates:

1-Excellent dater:

- Regular Cycle for at least 3 months before last menstrual period
- No hormonal contraception
- Non lactating
- Had 2 U/S (at 1st and 2nd Trimesters and both suits the date)

2-Good Dater: Loss one of the 4 criteria 3-Poor Dater: Loss of all criteria

2- Fetal Hypoxia:

1-Fetal movements count (Cardiff rule of 10 = at least 10 movements in 10 hours)

**Fetus starts movement 16-18 weeks

2-Non Stress Test (NST): CTG with no stress placed on the fetus during the test.

Cardiotocography (CTG): recording the fetal heartbeat and the uterine contractions

a-Basal Heart rate: (normal = 120-160, Tachy >160, Brady<120)

b-Variability: fluctuations in the fetal heart rate (Indicator that fetus is reactive)

*Short term (Beat-to-beat) *Long Term

c-Acceleration: abrupt increase in FHR above baseline

Reactive → increase of 15 BPM above baseline for 15 second duration at least twice in a 20 minute.

d-Deceleration: opposite of acceleration, sign of Hypoxia

*Acute: d.t. Cord Prolapse *Chronic: (spontaneous deceleration)

3-Contraction Stress test

Induce uterine contractions & monitor FHR to determine how well the fetus will cope with the contractions of childbirth.

*Early deceleration: (normal): Gradual decrease in FHR with deceleration onset that reaches least value with the peak of a contraction.

*Late deceleration: Onset of the deceleration occurs after the beginning of the contraction, and the least value occurs after the peak of the contraction. Sign of → Hypoxic ischemic encephalopathy (CP)

*Variable deceleration: Spontaneous deceleration not related to uterine contractions or fetal movement, worse sign than late

4-Vibroacoustic stimulation: Application of a vibratory sound stimulus to the abdomen of a pregnant woman to induce FHR accelerations (Used to shorten period of non-stress test)

*Scalp pH: (not in Egypt) to diagnose acidosis

5-Biophysical Profile:

Parameter	Normal (2 points)	Abnormal (0 points)
NST/Reactive FHR	At least 2 accelerations in 20 minutes	Less than 2 accelerations
Ultrasound	Fetal breathing movements	At least one episode of > 30s
	Fetal gross body movements	At least two movements
	Fetal muscle tone	At least one episode of (Flexion-Extension-Flexion) or Closed Fist
	Amniotic Fluid	At least one pocket > 2 cm or AFI = 10-15
*Amniotic Fluid Index (AFI):		

Estimate of the amount of amniotic fluid in the four quadrants of the uterus by ultrasound

-Normal → 10-15 -Polyhydramnios → >15 -Oligohydramnios → < 10

Interpretation:

- ≤2 → Labor induction
- 4 → Labor induction if >32 w / Repeat test same day if <32 w, the delivery if BPP <6
- 6 → Labor induction if >36 / Repeat test in 24 h if <36 w, then delivery if BPP <6, and follow-up if >6
- 8 → Labor induction if there is an oligohydramnios

***Modified physical profile:**

1-Nonstress Test (Sign of Acute Fetal hypoxia) 2-AFI (Sign of Chronic Fetal stress)

Other Investigations:

Doppler's U/S: Examination the blood flow through the umbilical cord between the placenta & the baby.

Reduced, absent or reversed end-diastolic velocity is indicator of increased risk of stillbirth, asphyxia, chromosomal and congenital abnormality



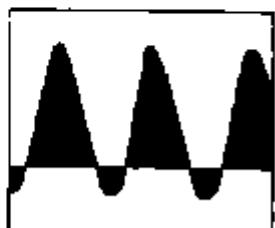
Normal pregnancy



Reduced end diastolic velocity



Absent end diastolic velocity



Reversed end diastolic velocity